OPMI PENTERO 900

The Next Generation

ZEISS

We make it visible.

OPMI PENTERO 900
The Next Generation

Evolution in Excellence

OPMI® PENTERO® 900 represents the next generation visualization system. Building on the groundbreaking innovations introduced in 2004, it combines unique design concepts and new functionalities in a proven, fully-integrated platform. Key functions have been enhanced and new visualization methods integrated, raising OPMI PENTERO 900 to a new level of performance. OPMI PENTERO 900 continues the evolutionary process, turning technological progress into medical innovations effectively advancing what is possible in modern microsurgery.

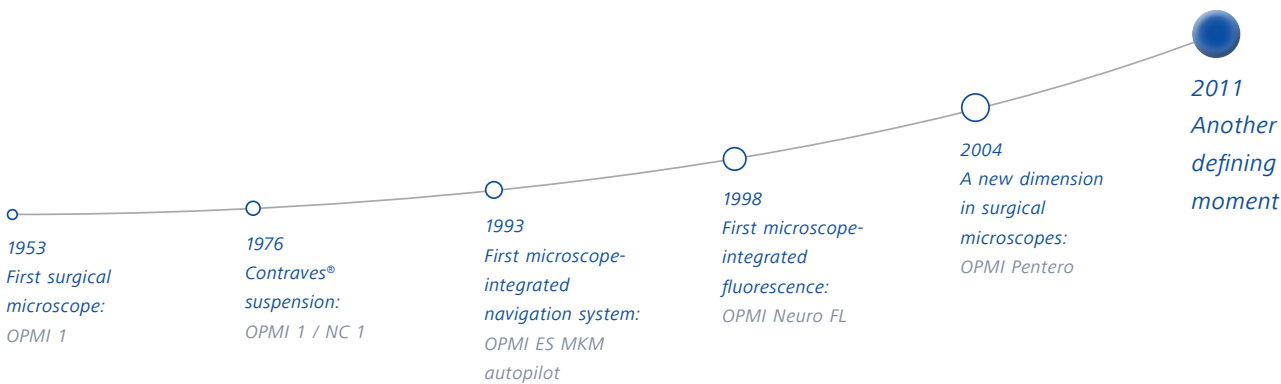**Experience the new OPMI PENTERO 900.**

■ **Brilliant Visualization**
Experience optical immersion with state-of-the-art apochromatic optics, razor-sharp video images in full HD quality and innovative fluorescence methods.

■ **Superior Performance**
Smooth, intuitive system handling and superior functionality ensure efficient surgery and fast system set-up.

■ **Beyond Visualization**
OPMI PENTERO 900 interacts with current and emerging workplace technologies and workflow based solutions to create a better OR experience.

1953
First surgical microscope:
OPMI 1

1976
Contraves® suspension:
OPMI 1 / NC 1

1993
First microscope-integrated navigation system:
OPMI ES MKM autopilot

1998
First microscope-integrated fluorescence:
OPMI Neuro FL

2004
A new dimension in surgical microscopes:
OPMI Pentero

2011
Another defining moment

// INNOVATION
MADE BY CARL ZEISS

Experience Optical Immersion

OPMI PENTERO 900 delivers state-of-the-art apochromatic optics providing crystal-clear images, sharp details and natural color rendition. Whether viewing through the eyepieces or on its flexible and integrated HD touchscreen display, OPMI PENTERO 900 elevates visualization of the surgical field to the next level. The entire HD video chain – camera, recorder, editor and monitor – is fully integrated into the system without the need for external components, exposed cabling or the use of multiple control interfaces. The HD video system can be configured and controlled via the central HD touchscreen, handgrip or foot switch for maximum flexibility and surgical performance. OPMI PENTERO 900 offers a unique HD experience with visual brilliance for live demonstrations, teaching presentations and patient documentation.

Continuation of Scientific Progress

Carl Zeiss has partnered with visionary thought leaders in the development of innovative intraoperative fluorescence technologies. The first fluorescence module, INFRARED 800™, successfully established intraoperative fluorescence as a key visualization technology. FLOW® 800 is a unique tool enabling the visual analysis of blood flow dynamics, further establishing Carl Zeiss as a leader in intraoperative fluorescence. With BLUE 400 and now, with the introduction of YELLOW 560™, we further broaden the capability for fluorescencebased research applications. With its intuitive workflow, automated functions and unmatched performance, the PENTERO 900 platform supports fluorescence-based surgeries like no other system.

Uniquely Designed Apochromatic Optics
The distinctive design concept with ZEISS apochromatic optics throughout the entire optical pathway allows the system to deliver unmatched optical clarity, detail resolution and color reproduction, both through the eyepieces and the video image.

Fully Integrated HD Video
The fully integrated HD video camera, recorder and editor enable surgeons to capture razor-sharp images for teaching, documentation and presentation purposes. All video functions can be centrally controlled from the intuitive graphical user interface.
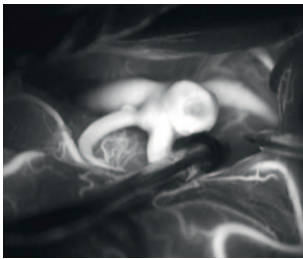
Brilliant High Definition Video Display
The large touchscreen display delivers impressively, crisp images in HD quality. The extendable suspension arm allows the display to be rotated, tilted or moved into different viewing positions.
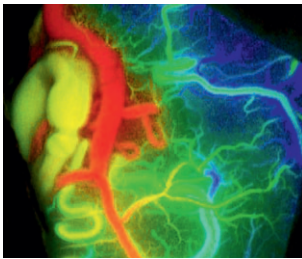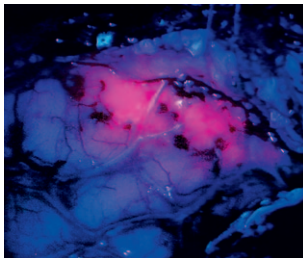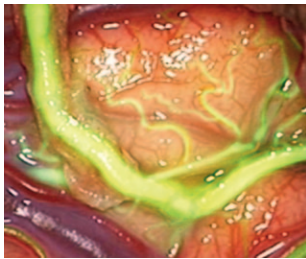
High-quality Data Injection
The advanced MultiVision™ display significantly enhances image quality and enables efficient data injection during procedures. Higher resolution, enhanced contrast and better color rendition ensure outstanding quality leading to improved outcomes.

INFRARED 800[1]
Intraoperative visual assessment of blood flow and vessel patency during AVM, bypass and aneurysm surgery. INFRARED 800 is indicated for use in neurosurgery, plastic and reconstructive procedures and coronary artery bypass graft surgery.

FLOW 800[1]
Unique fluorescence application enabling visual analysis of vascular blood flow dynamics. It compiles INFRARED 800 video sequences into visual maps, diagrams or side-by-side images, enabling an in-depth interpretation of fluorescence videos.

BLUE 400[2]
Capable of supporting fluorescence-based surgery for research applications by providing visualization in the 620-710 nm range. BLUE 400 is a completely integrated module with no external components or cables. Optionally available in HD quality.

YELLOW 560[3]
Visualizes in the 540 to 690 nm wavelength range for supporting research applications. It is the first ZEISS fluorescence module capable of highlighting fluorescent structures while viewing surrounding structures in their natural color.

[1] For the complete 510(k) summary for INFRARED 800 with FLOW 800 option, visit http://www.accessdata.fda.gov/cdrh_docs/pdf10/k100468.pdf.
[2] Image obtained with investigational new drug.
[3] Image obtained with drug under investigation for new intended use.

Maximum Efficiency

OPMI PENTERO 900 is a unique surgical visualization platform specifically conceived and designed for even the most demanding microsurgical applications. Extended system ergonomics and functions provide increased convenience, streamlining the surgical workflow. All relevant functions are combined into a cohesive system that can be controlled from the intuitive touchscreen user interface. Smooth system handling and superior performance are delivered through proven functions like mouth switch control, a unique depth of field, AutoFocus™ and many more. The Foldable Tube f170/f260 and wireless foot control panel enhance ergonomics, improving surgeon comfort and performance.

OR Turn-Around Simplified

Designed as much for the OR staff as for the surgeon, OPMI PENTERO 900 incorporates workflow-conducive features that reduce prep time for the nursing staff before each surgical case. AutoBalance™ quickly balances the microscope at the touch of a button, AutoDrape® facilitates a quick and easy draping process, and the unique FlexiTrak™ enables the OR staff to easily maneuver the system in the clinical environment. Additionally, the intuitive user interface allows for easy access to all microscope functions through a large, HD touchscreen monitor including patient data, pre-configured surgeon settings and video recording. More than any other surgical microscope system, OPMI PENTERO 900 streamlines the surgical workflow and maximizes OR efficiency.
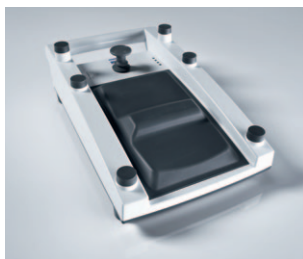
Dynamic Foldable Tube
The highly flexible Foldable Tube f170/f260 offers increased positioning capability, magnification and user comfort. With a quick dial turn, the integrated PROMAG™ functionality provides an additional 50 percent magnification gain.

Unparalleled Depth of Field
Depending on preference or application, the integrated, electronically controlled double-iris diaphragm enables surgeons to choose between maximum light and resolution or depth of field.

Efficient Light Settings
The patented, two-channel illumination design reduces shadowing in deep cavities. The Automatic Iris Control™ limits illumination to the field of interest and the new Focus Light Link™ automatically limits brightness, both in the aim of preventing inadvertent light exposure.

Wireless Foot Control
The wireless foot control, designed to manage multiple microscope functions, can be freely positioned for rapid set-up and user convenience during surgery. The intelligent power management function ensures superior long-lasting operability.

AutoDrape
AutoDrape allows for easy and fast system draping by automatically evacuating air from the sterile drape. The drape clings tightly to the system in a matter of seconds without obstructing the microscope's mobility.

AutoBalance
Automatic balancing of the microscope with the press of a single button for fast system set-up. AutoBalance can even be performed while the system is draped ensuring optimum system mobility. A unique fine balance function also allows precise system control via the mouth switch.

VisionGuard Drape Technology
ZEISS drapes are manufactured with VisionGuard®, a unique, optical lens that works with the microscope's objective as a single optical unit for unparalleled optical clarity. The lens can be replaced with a new sterile lens during surgery without compromising sterility.

Rapid Remote Diagnosis
Fast internet access via VPN enables remote diagnostic capability, resulting in better service support and improved system uptime. System log files can be accessed online by ZEISS service specialists for rapid analysis and support.

Workplace Innovations

Close cooperation with leading surgeons across the globe led to the development of a ground-breaking visualization platform. OPMI PENTERO 900 offers advanced functionality in an elegantly designed workplace. The thoughtfully designed workflow based solutions, specifically tailored to meet the demands of clinical applications, differentiate this system from any other.

The complete integration of workplace components as well as the ability to adapt emerging technologies present the surgeon with a wide variety of product solutions to meet their individual requirements. Now more than ever, OPMI PENTERO 900 provides an experience that goes far beyond visualization.

Intelligent Design
From complete cable and component integration to overall intuitive system design, OPMI PENTERO 900 creates the optimal surgical environment. One cohesive touchscreen interface serves all system configurations and functions.

Universal Connectivity
OPMI PENTERO 900 offers comprehensive connectivity with workplace technologies and data management functionality. Integrated modules like MultiVision and DICOM ensure a seamless connection with other visualization systems and into the hospital's communication infrastructure, respectively.

Workflow-based Solutions
OPMI PENTERO 900 provides tailored, workflow-based solutions that are accessible through a common interface. The modules were designed with surgeons for surgeons to meet the requirements of clinical applications and are seamlessly integrated into the surgical workflow.

Application-driven Technologies
Focused on enhancing clinical outcomes, OPMI PENTERO 900 provides surgeons with application-driven solutions like MultiVision and fluorescence-based visualization. Each integrated module introduces a new level of simplicity, speed and accuracy to the surgical procedure.

Technical Data

Rated Voltage	(115V): 100 V – 125 V
	(230V): 220 V – 240 V
Current Consumption	max. 1.200 VA
Rated Frequency	50 Hz – 60 Hz
Electrical Standard	Complying with IEC 60601-1:2005; UL 60601-1; CAN/CSA-C22.2 No. 601.1-M90
	Protection class I, degree of protection IP20
	Type B equipment
	Class 2 laser product as per EN 60 825-1:2002
Weight	Weight approx. 358 kg
	Weight of system incl. transport container: approx. 610 kg

OPMI PENTERO 900
Standard and Optional Features

Standard Configuration

Apochromatic Optics	Motorized focus; Varioskop® with working distance 200 – 500 mm
	Motorized zoom; 1:6 zoom ratio
	10x magnetic widefield eyepieces with integrated eyecups
	Autofocus with 2 visible laser dots, automatic mode with magnetic brakes
Illumination	Superlux® 330 light source with 2 x 300 W xenon
	Automatic Iris Control for adjusting the illumination to the field of view
	Individual light threshold setting
	Focus Light Link: working distance controlled light intensity
	Display of remaining lamp life time
System Operation	Multifunctional programmable handgrips
	Magnetic clutches for all system axes
	Central user interface
	XY robotic movement in 3 axes (variable speed)
System Setup	AutoBalance
	AutoDrape – air evacuation system
	Mouthswitch fine balance
Video	22" HD video touchscreen on extendable arm
	Integrated 3-CMOS SD video camera
	Integrated video still image capturing on HDD and USB-media
Connectivity / Data Management	Video-in for external SD video sources
	Navigation interface
	Interface for micromanipulator
	Remote diagnosis via internet/VPN

Options

Video	Integrated 3-CMOS HD video camera
	Integrated SD or HD video recording and editing
	Adaptation of consumer (SLR) photo/video camera
Intraoperative Fluorescence	BLUE 400
	INFRARED 800
	INFRARED 800 with FLOW 800
	YELLOW 560
Connectivity / Data Management	DICOM module for patient data transfer from/to PACS
Accessories	12.5x magnetic widefield eyepieces with integrated eyecups
	Straight tube, focal length f = 170mm
	Stereo co-observation tube
	Foldable Tube f170/f260, including the PROMAG function for additional 50% magnification and integrated rotate function
	Wired foot control panel
	Wireless foot control panel

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